Claims

1. A test vertebrate embryo for screening compounds for the ability to affect cell death, said embryo being prepared by the process of:

a) providing a vertebrate embryo, and

b) contacting said embryo with an agent which increases apoptosis in cells of said animal.

2. The embryo of claim 1, wherein said agent is staurosporine.

3. The embryo of claim 1, wherein said vertebrate is a zebrafish.

4. A method of testing a compound for the ability to affect cell death, said method comprising the steps of:

a) providing an animal which, at an embryonic stage, has been contacted with an agent which increases apoptosis in cells of said animal,

b) contacting said animal with said compound, and

c) determining whether said compound affects cell death in said animal.

5. The method of claim 4, wherein step b) is carried out with said animal at an embryonic stage.

6. The method of claim 4, wherein said animal is a vertebrate.

7. The method of claim 6, wherein said vertebrate is a fish.

8. The method of claim 7, wherein said fish is a zebrafish.

9. A method of claim 6, wherein said determining step c) includes determining whether said compound affects cell death in a Rohon-Beard neuron.

10. A method of claim 9, wherein said determining step c) further includes determining whether said compound rescues a Rohon-Beard neuron that has been contacted with an agent which increases apoptosis.

11. A method of claim 4, wherein said determining step c) includes using an antibody to label a cell which undergoes cell death.

12. The method of claim 4, wherein said agent is staurosporine.

13. A method of testing a compound for the ability to affect cell death, said method comprising the steps of:

a) providing an osteichthes embryo which is translucent or transparent,

b) contacting said compound with said embryo, and

c) visually observing the pattern or extent of cell death in said embryo.

14. The method of claim 13, wherein said embryo is a zebrafish embryo.

15. The method of claim 13, wherein cells in said embryo undergoing programmed cell death are labeled in the living embryo for visualization microscopically.

16. The method of claim 15, wherein labeling is carried out by terminal deoxynucleotide transferase dUTP nick labeling.

17. A method for obtaining information on cellular processes, said method comprising the steps of:

a) providing a test and a control zebrafish embryo,

b) subjecting said test embryo to test conditions, and

c) visually observing differences in cells of the test and control embryos, said differences resulting from application of said test conditions.

18. The method of claim 17, wherein said test conditions include mutagenesis-inducing conditions.

19. The method of claim 17, wherein said test and control zebrafish embryos are pre-treated with an agent which affects programmed cell death.

20. The method of claim 17, wherein said test conditions include a test compound, and said observing step includes observing whether said test compound inhibits cell death in, or rescues, said test embryo.

21. The method of claim 20, wherein said observing step includes observing Rohon-Beard neurons.

22. The method of claim 19, wherein said agent is a protein kinase inhibitor.

23. The method of claim 22, wherein said protein kinase inhibitor is staurosporine.

24. The method of claim 17, wherein said test conditions include contacting said embryos with a cell death inhibitor.

25. The method of claim 24, wherein said observing includes observing neurons of said embryos, to determine whether neurons in said test embryo which are saved from cell death develop or function normally.

26. The method of claim 24, wherein said cell death inhibitor is a caspase inhibitor.

27. The method of claim 17, wherein the cellular process which is investigated is selected from the group consisting of:

a) neuronal cell function,

b) neuronal connectivity,

c) cell development,

d) tissue development, and

e) organ development.

28. A method of testing a compound for the ability to affect expression of a gene whose expression affects cell death, said method comprising the steps of:

(a) providing an osteichthes test embryo which is translucent or transparent, wherein said gene is expressed in said embryo, wherein said gene

either is not normally expressed in said osteichthes, or is normally expressed in said osteichthes at a lower level than in said test embryo,

(b) contacting said compound with said embryo, and

(c) visually observing the pattern or extent of cell death in said embryo.

29. The method of claim 28, wherein said osteichthes embryo is a zebrafish embryo.

30. The method of claim 28, wherein said gene is a eukaryotic gene encoding a protein which inhibits cell death.

31. The method of claim 30 wherein said gene encodes bcl-2, and is over-expressed in said embryo.